



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/816,691

04/01/2004

Eric R. Blomiley

MI22-2510

1647

21567 7590 04/21/2008
WELLS ST. JOHN P.S.
601 W. FIRST AVENUE, SUITE 1300
SPOKANE, WA 99201

EXAMINER

DHINGRA, RAKESH KUMAR

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

04/21/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/816,691	Applicant(s) BLOMILEY ET AL.	
	Examiner RAKESH K. DHINGRA	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,9-22,25-30,32,33,37 and 162 is/are pending in the application.
- 4a) Of the above claim(s) 9,10,15-21,25-29,32 and 33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,11-14,22,30,37,162 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/15/08 has been entered.

Response to Arguments

Applicant's arguments with respect to claims 1-6, 11-14, 22, 30 and 37 have been considered but are moot in view of the new ground(s) of rejection as explained hereunder.

Applicant has amended claims 1, 22, 25-30, 32, 33 and 37 by adding new limitations (for example in claim 1, limitation – “vertical”, “aligns with”, “which is angled radially downward toward the substrate receiving recess”, radially”, “radially outward”, “elevationally”, “location” and received radially” have been added). Further, applicant has cancelled claims 23 and 24.

Accordingly claims 1-6,9-22,25-30,32,33,37 and 162 are now pending out of which claims 1-6,11-14,22,30,37,162 are presently active.

Further, response to applicant's arguments regarding claim rejections is given hereunder.

Claim 1 - Applicant argues that Sinha does not disclose that its projections 224 have radially inner sidewalls which align with and extend outwardly from a recess outer peripheral sidewall perpendicularly relative to a recess base and that Sinha et al's. Figs. 5 and 6 do not have an outer peripheral vertical sidewall which connects with and extends perpendicularly from its recess base. Specifically in Fig. 6, the angled surface opposite the lead line extending from reference numeral 220 is neither vertical nor connecting with and extending perpendicularly from a recess base. Further, it would

Art Unit: 1792

not be obvious to modify the structure disclosed by Sinha et al. whether taken alone or in combination with Marohi et al. as doing so would defeat the fundamental purpose of Sinha et al. to provide peripheral purge gas flow through its conduit 220.

Examiner responds that the office action does not refer to the angled surface opposite the lead line extending from reference numeral 220 (Fig. 6 of Sinha), as the outer peripheral inner sidewall, as indicated by the applicant in arguments. Sinha teaches a recess outer peripheral sidewall in Figure 6 and (col. 13, lines 25-35), where Sinha specifically states “heater plate upper surface 26 terminates in an upwardly projecting guide receiving portion 222 which is an annular flat raised portion, disposed 0.002 to 0.005 inches above upper surface 26”. Thus as per Sinha there is a vertical side wall portion at the location in Fig. 6 where the recess base 26 meets with the horizontally extending guide receiving portion 222. Further, Applicant’s argument regarding non-obviousness of combining Sinha with Marohi is rendered moot, in view of changed ground of rejection as explained below, since Sinha is now not combined with Marohi.

Applicant further argues that Sinha does not teach the amended claim 1 recitation that the radially extending uppermost straight surface of the projection must extend radially outward to an elevationally uppermost location which is received radially at the vertical radially outermost peripheral edge of such projection and to do so the surface 230 (in Sinha Fig. 6) would need to extend to the point/corner proximate the lead line extending from reference numeral 231.

Examiner responds that Sinha teaches that projections 224 enable to properly position and align the substrate on the heater plate 26, which is similar to the function of applicant’s invention. Though Sinha does not teach the claimed exact shape of the projection that is, radially extending uppermost straight surface of the projection must extend radially outward to an elevationally uppermost location which is received radially at the vertical radially outermost peripheral edge of such projection, absent any specific disclosure regarding criticality of such shape feature, it would be obvious to select the shape of

Art Unit: 1792

the projection, as a matter of choice by optimizing with respect to process limitations like size of substrate and its expected eccentricity with respect to the required purge gas channel opening. Thus Sinha teaches all limitations of claims 1 and therefore claims 1-4 and 11 have been rejected under 35 USC 103 (a) as explained below. Further balance claims 5, 6, 12-14, 22, 30, 37 and 162 have also been rejected under 35 USC 103 (a) as explained below.

Applicant's argument regarding Marohi reference are now moot since the reference has not been cited in the changed grounds of rejection as explained below.

Further applicant's argument regarding rejection of claim 1 over Fodor in view of Marohi are also moot since Fodor reference is now not cited for rejection of claim 1, in the changed grounds of rejection as explained below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner

Art Unit: 1792

to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sinha et al (US Patent No. 5,882,419).

Regarding Claim 1: Sinha et al teach an apparatus (Figures 1, 6) comprising:

A heater plate 18 (body of substrate support/susceptor) with a substrate receiving surface 26 and having a recess (formed by the junction of heater plate upper surface 26 and upwardly projecting guide receiving guide receiving portion 222), the recess comprising a outer peripheral vertical sidewall and a recess base and with the outer peripheral vertical sidewall extending perpendicularly from the recess base (e.g. Fig. 6 and col. 13, lines 25-35);

a plurality of (six) guide pins 224 (projections) extending outwardly from a portion of the face, and comprising a radially inner vertical sidewall (vertical portion of the guide pin wall) that aligns with and extends outwardly from the recess outer peripheral vertical sidewall to a projection radially extending uppermost straight surface 226, which is angled radially downwards towards the substrate receiving recess, all of the radially inner vertical sidewall aligning with and extending outwardly from the recess outer peripheral vertical sidewall perpendicularly and vertically relative to the recess base to the projection radially extending uppermost straight surface,

the projections respectively comprising a vertical radially outermost peripheral edge (vertical edge of mounting tab 231) [e.g. col. 13, line 5 to col. 14, line 64].

Sinha et al do not explicitly teach that the radially extending uppermost straight surface extending radially outward to an elevationally uppermost location which is received radially at the vertical radially outermost peripheral edge.

Art Unit: 1792

Examiner responds that Sinha teaches that projections 224 enable to properly position and align the substrate on the heater plate 26, which is similar to the function of applicant's invention. Though Sinha does not teach the exact shape of the projection that is, radially extending uppermost straight surface of the projection must extend radially outward to an elevationally uppermost location which is received radially at the vertical radially outermost peripheral edge of such projection, absent any specific disclosure regarding criticality of such shape feature, it would be obvious to select the shape of the projection, as a matter of choice by optimizing (through routine experimentation) with respect to process limitations like size of substrate and its expected eccentricity with respect to the required purge gas channel opening etc.

In this connection courts have ruled:

1) It was held in *re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) that the shape was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular shape was significant. (Also see MPEP 2144.04(d)).

2) It would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable through routine experimentation in the absence of a showing of criticality. *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Regarding Claims 2-4: Sinha et al teach that face 222 is annular and is substantially planar (Fig. 6).

Regarding Claim 11: Sinha et al teach that guide pins 224 (projections) are received about a circle on the face portion 222 (Fig. 6).

Claims 5, 6, 12-14, 22, 30 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sinha et al (US Patent No. 5,882,419) as applied to claims 1-4, 11 in view of Fodor et al (US 7,024,105).

Regarding Claim 5: Sinha et al teach all limitations of the claim except that substrate receiving recess is annular.

Art Unit: 1792

Fodor et al teach a substrate heater assembly comprising a support body 804 with an annular recess 816 for holding a substrate 112 and where the recess includes an outer peripheral vertical sidewall 814 (e.g. Fig. 8 and col. 6, line 50 to col. 7, line 18).

Therefore it would have been obvious to one of ordinary skills in the art at the time of the invention to provide an annular substrate receiving recess in the substrate holder body as taught by Fodor et al in the apparatus of Sinha et al to avoid damage to wafer due to minimal contact with the backside of wafer and also due to different thermal expansion of the wafer and the substrate support body material during heating of the substrate.

Regarding Claim 6: Fodor et al teach that face portion 806 is annular (Fig. 8).

Regarding Claims 12-14: Fodor et al teach another embodiment (Figs. 2A, 2B, 3A, 3B, 4A, 4B) comprising a substrate holding body 132 with a substrate receiving 150 wherein a substrate 112 is supported. Fodor et al also teach a ring 134 with a continuous lip 302 (similar to the recess having an outer peripheral vertical side wall with a projecting lip). Fodor et al further teach that lip 302 is used to guide the substrate 112 into the pocket 150. Fodor et al additionally teach that instead of the continuous lip 302, ring can have crowns (projections) 402 for guiding the substrate into the pocket. Fodor et al also teach that the width of crowns ranges from 0.5 to 5 mm and that crowns can number from 3 to 12.

Assuming the inner diameter of ring to be 200 mm (size of wafer), the circumference of ring would be approx 600 mm, and assuming the number of projections to be say 6, the projections would collectively occupy between 1.5 % to 5% of the circumference of the circle which meets the claim limitations of 3-10% (col. 5, lines 32-45). It would be obvious to use plurality of projections instead of a continuous lip to minimize the area of contact with the edge of the wafer during guiding of the wafer into the pocket.

Regarding Claim 22: Fodor teach that the body 134 has an outermost peripheral edge, the projection vertical radially outermost peripheral edge (of projections 402) being received radially inward of the body outermost peripheral edge (Fig. 4A).

Art Unit: 1792

Regarding Claim 30: Fodor et al teach the recess outer peripheral sidewall 814 and the radially inner sidewall (formed integrally and extending from peripheral side wall) have a combined elevational length which is greater than thickness of a substrate 112 for which the susceptor is designed (Figs. 9A, 9B).

Regarding Claim 37: Fodor et al teach the elevationally upper most location (of projections 914) has an uppermost elevation which is received higher than an uppermost surface of a substrate 112 for which the susceptor is designed when said substrate is received by said recess 816 (Figs. 9A-9D).

Claim 162 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sinha et al (US Patent No. 5,882,419) as applied to claims 1-4, 11 in view of Mahawilli (US 6,530,994).

Regarding Claim 162: Sinha et al teach all limitations of the claim except that the body comprises SiC coated graphite.

Mahawilli teaches a CVD apparatus with a substrate support body 10 that comprises SiC coated graphite (e.g. Figs. 3, 4 and col. 5, lines 19-30).

Therefore it would have been obvious to one of ordinary skills in the art at the time of the invention to provide the substrate support body that comprises SiC coated graphite as taught by Mahawilli in the apparatus of Sinha et al as known materials for use in the heated substrate support assemblies in CVD equipment.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RAKESH K. DHINGRA whose telephone number is (571)272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

Art Unit: 1792

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rakesh K Dhingra/
Examiner, Art Unit 1792

/Karla Moore/
Primary Examiner, Art Unit 1792